UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE

January 18, 2011

MEMORANDUM

SUBJECT: Revision to the November 1, 2010 National Remedy Review Board Recommendations for the Hanford Site, 200-PW-1, 3, 6 Waste Sites (Hanford Site)

FROM: Amy R. Legare, Chair
National Remedy Review Board

TO: Daniel D. Opalski, Director
Office of Environmental Cleanup
U.S. EPA Region 10

Purpose

The National Remedy Review Board (the Board) has completed its review of the proposed cleanup action for the Hanford Superfund site, 200-PW-1, 3, 6 waste sites, in Richland, WA. This memorandum documents the Board's advisory recommendations.

Context for Board Review

The Administrator established the Board as one of the October 1995 Superfund Administrative Reforms to help control response costs and promote consistent and cost-effective remedy decisions. The Board furthers these goals by providing a cross-regional, management-level, "real time" review of high cost proposed response actions prior to their being issued for public comment. The Board reviews all proposed cleanup actions that exceed its cost-based review criteria.

The Board review is intended to help control remedy costs and to promote both consistent and cost-effective decisions. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) mandates that, in addition to being protective, all remedies must be cost-effective. The Board considers the nature of the site; risks posed by the site; regional, state, tribal and potentially responsible party (PRP) opinions on proposed actions; the quality and reasonableness of the cost estimates; and any other relevant factors or program guidance in making our advisory recommendations. The overall goal of the review is to ensure sound decision making consistent with current law, regulations, and guidance.

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Generally, the Board makes the advisory recommendations to the appropriate regional division director. Then, the region will include these recommendations in the administrative record for the site, typically before it issues the proposed cleanup plan for public comment. While the region is expected to give the Board's recommendations substantial weight, other important factors, such as subsequent public comment or technical analyses of response options, may influence the region's final remedy decision. The Board expects the regional division director to respond in writing to its recommendations within a reasonable period of time, noting in particular how the recommendations influenced the proposed cleanup decision, including any effect on the estimated cost of the action. Although the Board's recommendations are to be given substantial weight, the Board does not change the Agency's current delegations or alter the public's role in site decisions; the region has the final decision-making authority.

Overview of the Proposed Action

The Hanford Site is a federal facility located in southeastern Washington State. In 1989 plutonium production ceased and work shifted to cleanup of the site. The Department of Energy (DOE) is responsible for the cleanup of the Site while EPA and the Washington State Department of Ecology are responsible for the oversight of CERCLA and RCRA cleanup activities, respectively. This proposed action addresses the Plutonium/Organic-Rich Process Condensate/Process Waste Group OU (200-PW-1 OU), the Organic-Rich Process Condensate/Process Waste Group OU (200-PW-3 OU), and the Plutonium Process Condensate/Process Waste Group OU (200-PW-6 OU). These three areas include17 sites that are located within the central Hanford area, which has been designated as an industrial land use area.

Three of the 200-PW-1 waste sites received high-salt aqueous-phase process waste from chemical processes and plutonium-finishing activities. The waste streams contained plutonium and americium as well as a concentrated nitrate solution containing dissolved metal nitrates and significant volumes of organics. The other 200-PW-1 waste sites primarily received neutral to low-salt aqueous waste streams that contained plutonium and americium, with negligible amounts of organics. Since 1992, an expedited response action in the 200-PW-1 has used soil vapor extraction (SVE) to minimize the migration of carbon tetrachloride in the vadose zone. Remediation using SVE is continuing. 200-PW-3 consists of five waste sites. They received effluent from an operating plutonium and uranium extraction plant. PW-3 waste streams contained fission products such as Cesium-137 and both aqueous and nonaqueous phase organics. Lastly, 200-PW-6 contains four waste sites which received wastes from plutonium isolation processes but did not include organics.

The identified EPA preferred alternative, known as Alternative 3C, would remove a significant portion of plutonium contamination based on an evaluation of soil contaminant concentration at depth. This remedy will remove the mass of contamination, which would greatly reduce future risk to human health and the environment. Additionally, the Hanford Project Office believes this remedy appears to align closely with the values heard from concerned stakeholders and provides the best balanced alternative.

National Remedy Review Board Advisory Recommendations

The Board reviewed the information package describing this proposal and discussed related issues with Emerald Laija and Dennis Faulk of the EPA Hanford Project Office on August 17, 2010. Based on this review and discussion the Board offers the following comments:

Institutional Controls

The package presented to the Board describes institutional controls (ICs) that are common components of all remedial alternatives, but there is no differentiation between the types of controls necessary in order for each of the alternatives (and sub-alternatives) to be protective. For example, levels of plutonium left in place in some of the alternatives may present a future risk to well drillers that inadvertently drill through this contamination. The Board recommends that the Region work with DOE to develop ICs for the various remedial alternatives consistent with the amount of residual waste to ensure a protective remedy. The need for more robust ICs to ensure protectiveness when leaving highly toxic contamination in place over the long term may not be as cost-effective as more extensive removal of the waste. The Board recommends that more specific ICs be included in the decision document.

Principal Threat Waste

The information presented to the Board indicates that under the preferred alternative, principal threat waste (PTW) materials would remain onsite. It is recommended that the Region describe in the decision document how PTW materials that remain onsite will be addressed to meet guidance with respect to treating PTW to the "maximum extent practicable." In particular, the decision documents should address the statutory and NCP preference for treatment to the maximum extent practicable of hazardous substances that, like americium and plutonium, are highly toxic. The Board notes that the preferred alternative would result in little or no treatment for acknowledged PTW that is left onsite or disposed of at the WIPP; the decision documents should explain why treatment is not preferred. The Board recognizes that the WIPP is a unique containment facility.

Remedial Action Objectives

The Region's preferred alternative includes a mass removal cleanup objective for plutonium waste as opposed to a numerical concentration criterion. The proposed 95% mass removal goal appears to be based on an analysis evaluating the amount of plutonium that can be removed before costs significantly increase. This approach appears to be inconsistent with the one described in the NCP [40 CFR 300.430(e)] whereby cleanup goals are established based on residual risk levels. The Board is concerned that there seems to be no direct relationship between risk and plutonium concentrations at particular depths. As a result, the Board is unable to determine whether the preferred alternative represents a reasonable, cost-effective remedy for the plutonium contamination. The Board recommends that the Region perform the appropriate analysis to link residual risk, plutonium levels and excavation depths and that the results be used to establish RAOs (and thereafter, cost-effective cleanup levels) for the plutonium waste remediation at the site.

Human Health Risk

The Region's draft preferred alternative (3C) proposes removal of approximately 95% of the plutonium mass. This percent removal results in excavation depths well below the 15 feet required by the State Model Toxics Control Act to ensure protectiveness under an industrial exposure scenario. However, the package was not clear if the remaining plutonium mass would be protective under an intruder scenario. The Board recommends that the Region should explain what level of excavation generally represents the transition from acute toxicity to chronic toxicity for an intruder scenario. This explanation should be provided in the feasibility study and future decision documents.

As the Board has observed in the past, EPA's risk-based approach under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the NCP is different than Department of Energy's (DOE's) dose-based approach that was used to establish risk-based concentrations in Table 5.2. The *Radionuclide Preliminary Remediation Goals (PRGs) for Superfund* calculator (OSWER Directive 9355.01-83A, February 7, 2002) presents exposure parameters and equations that should generally be used for calculating radionuclide PRGs. The Board recommends that the decision document reflect appropriate risk-based concentrations consistent with CERCLA and the NCP, in order to accurately reflect the risk to human health posed by the contaminants of concern (COCs) at this site. In addition, the Board recommends that the Region provide an explanation of the differences between the Superfund PRG calculator and the DOE RESRAD (residual radiation) dose model calculation of soil risks in future decision documents.

Remedy Performance

Based on the package provided to the Board, it appears that a monitored natural attenuation (MNA) approach for soil cleanup is one of several common components of the remedial alternatives. The preferred alternative, as presented in the package, appears to rely on MNA following removal of significant contaminant mass. The Board notes there is no existing CERCLA guidance on MNA for soils, but there is existing guidance on MNA for groundwater, which addresses issues like source removal, lines of evidence, and a reasonable time frame for achieving cleanup levels. The Board believes the discussion on page 76 of the package does not reflect the underlying recommendations in the existing MNA guidance. The Board recommends that the Region re-evaluate MNA for soils using the screening criteria for feasibility, i.e., effectiveness, implementability and cost. The Board also recommends that the decision documents more clearly explain how the MNA component of the preferred alternative will be protective.

Based on the presentation to the Board, it appears that the proposed remedy is intended to be consistent with the existing 2008 groundwater record of decision (ROD) regarding the cleanup of soils (especially dense non-aqueous phase liquid [DNAPL] concentrations as presented in Figure 3-5) and restoration of groundwater. The review package indicates that the current soil vapor extraction (SVE) remedy for soils will be upgraded by adding 10 wells and that the mass of carbon tetrachloride and other COCs could be reduced by a minimum of 95% in 25 years. This timeframe appears to be overly ambitious since Superfund actions typically addresses source actions (i.e. soils) first and how the source actions impact groundwater second. Therefore, the Board recommends that the proposed plan and ROD for this OU more clearly

explain that the source remedy strives to achieve the appropriate cleanup levels for soils in order to facilitate reaching the maximum contaminant levels (MCLs) for groundwater, as called for in the 2008 ROD. The remedies should be regularly monitored and optimized as needed.

Based on the information presented to the Board, it is not clear why the implementation of the source control portion of the removal, treatment, and disposal (RTD) alternative was being delayed for 10 years to allow continued implementation of the SVE system. Unless there is a technical basis for delaying the initiation of the source control component of the RTD alternative, the Board recommends that these activities not be delayed, and that the present worth cost analysis be updated to reflect the change.

Cost

The costs to implement the various alternatives presented in the package (shown in Table 7-3 and discussed elsewhere) do not include all the costs of the proposed alternatives. For example, these costs do not include the costs of final disposal at (WIPP), and possibly other elements of waste handling/treatment. The Board recommends that the cost estimates should be modified so that all of the costs of the proposed alternatives are included in the present value cost of each alternative.

Stakeholders

The Board notes that DOE, as a matter of policy, may choose to carry out a cleanup that is more robust than needed to achieve applicable or relevant and appropriate requirements (ARARs) and ensure protectiveness of human health. The Board also recognizes that DOE has been working closely with EPA, the State and local community groups during the remedy selection process and that close collaboration, which is consistent with Office of Solid Waste and Emergency Response's (OSWER's) Community Engagement Initiative, is reflected in the package presented to the Board and in DOE's letter to the Board. At the same time, the Board notes that the net present worth of the preferred remedy is significantly greater than other less costly alternatives that meet the threshold criteria. For example, the in-situ vitrification alternative may be implemented at half the cost of the preferred alternative (even before disposal costs are factored in). In addition, the in-situ vitrification alternative might be implemented with much less exposure to on-site workers and without many of the transportation and disposal alternatives associated with the TRD alternative. The Board recommends that the Region provide additional clarification on the cost-effectiveness of selecting Alternative 3C. The Board notes that the preferred alternative appears to have the support of DOE[1], The Hanford Advisory Board and the Washington State Department of Ecology. We recommend that DOE and the Region continue to work with interested stakeholders.

[1] However, with respect to high salt sites, DOE believes that the incremental increase in cost of $469,800,000 for retrieving and disposing of additional contaminated soil under Alternative 3c compared to Alternative 3a are highly disproportionate to the environmental and human health risks posed by the material.

Conclusion

We commend the Region's collaborative efforts in working with the Board and stakeholder groups at this site. We request that a draft response to these recommendations be included with the draft proposed plan when it is forwarded to the Office of Superfund Remediation and Technology Innovation's Site Assessment and Remedy Decisions (SARD) branch for review. The SARD branch will work with both your staff and the Board to resolve any remaining issues prior to your release of the record of decision. Once your response is final and made part of the site's administrative record, a copy of this letter and your response will be posted on the Board's website (http://www.epa.gov/superfund/programs/nrrb/).

Thank you for your support and the support of your managers and staff in preparing for this review. Please call me at (703) 347-0124 should you have any questions.

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